

A Primer on Gasoline Prices in Washington State

Gasoline, one of the main petroleum products from crude oil, accounts for about 17 percent of the energy consumed in the United States. Gasoline is used primarily for cars and light trucks, but is also used in recreational vehicles and boats, and various farm and other equipment. Diesel, or distillate fuel, is also a common transportation fuel and accounts for just under 6 percent of the energy consumed in the US: about 80 percent of diesel fuel is used for on- road type vehicles such as cars, and light and heavy duty trucks.

Gasoline and diesel fuel prices are perhaps the most well-known commodity prices in the nation, as people encounter them on a daily basis. Prices vary not only by type and grade of fuel, but also by location and season. Summer prices are typically higher, while fuel prices also tend to be higher on the East and West coasts and lowest in the producing regions of the Southeast. After being relatively stable during most of the 1990's gasoline and diesel prices have been both higher and more volatile over the last four years.

The following is a discussion of the recent fuel price volatility, presented in a question and answer format.

Where does our gasoline and diesel fuel come from?

Crude oil is extracted from underground reservoirs, transported to refineries and refined into a range of petroleum products. Total petroleum product consumption for Washington State was 6.4 billion gallons in 2001. Residents and businesses in the state consume significant quantities of gasoline and diesel fuel – about 2.7 billion gallons of gasoline and 0.90 billion gallons of diesel were used in internal combustion engines during 2001. Significant quantities of other petroleum products, such as jet fuel and residual fuel are also created and consumed. Washington State does not produce any crude oil, but instead relies on imports from Alaska (68%), Canada (12%), Argentina (6%), Saudi Arabia (5%), plus other foreign imports (9%) to supply its needs.

Gasoline, diesel fuels, and other petroleum products from crude oil are produced at five refineries located within Washington State. These refineries and their production capacities are listed below. A barrel of crude oil contains 42 gallons.

- BP West Coast Products LLC (Ferndale @ 225,000 Barrels per day)
- Shell Oil Products US (Anacortes @ 140,800 Barrels per day)
- Phillips 66 Co. (Ferndale @ 89,000 Barrels per day)
- Tesoro West Coast (Anacortes @ 115,000 Barrels per day)
- U.S. Oil & Refining Co. (Tacoma @ 35,150 Barrels per day)

Petroleum products produced at these refineries are distributed throughout Washington and to other parts of the Northwest by the Olympic Pipeline, barge and truck. Eastern Washington also receives some petroleum products from the Yellowstone Pipeline, which originates in Montana, and the Chevron Pipeline, which originates in Utah.

The US Energy Information Administration (EIA), a part of the U.S. Department of Energy, provides several useful links for additional information on petroleum products such as gasoline and diesel.

Primer on Gasoline Sources and Markets

<http://www.eia.doe.gov/neic/experts/contactexperts.htm>

Oil Market Basics

http://www.eia.doe.gov/pub/oil_gas/petroleum/analysis_publications/oil_market_basics/default.htm

Washington State - Petroleum Information

<http://tonto.eia.doe.gov/oog/info/state/wa.html>

How do recent gasoline prices compare with historical values?

Recent press releases highlight that gasoline or diesel prices have reached record prices. Expressed in nominal dollars (dollars of any particular year) this is true, but a more reasonable way to compare fuel costs in different time periods is to express the costs in constant dollars: a inflation index adjustment is applied to make dollars from a previous period equivalent to current dollars. Adjusted for inflation, historical gasoline prices in Washington peaked in 1981, when prices were significantly higher than today. Expressed in 2003 dollars a gallon of gasoline in 1981 would cost about \$2.46 per gallon. After the oil crisis in the late 1970's and early 1980's, average gasoline prices generally declined and by 1998 reached an all time low of \$1.22 per gallon in 2003 dollars. In 1970, a gallon of gasoline would cost about \$1.40 in 2003 dollars. Unless otherwise noted the prices in this report are in nominal dollars. For price comparisons over a 2 to 3 year time period, using nominal dollars is usually sufficient.

Visit the CTED Energy Policy Website to find out more about energy use and prices.

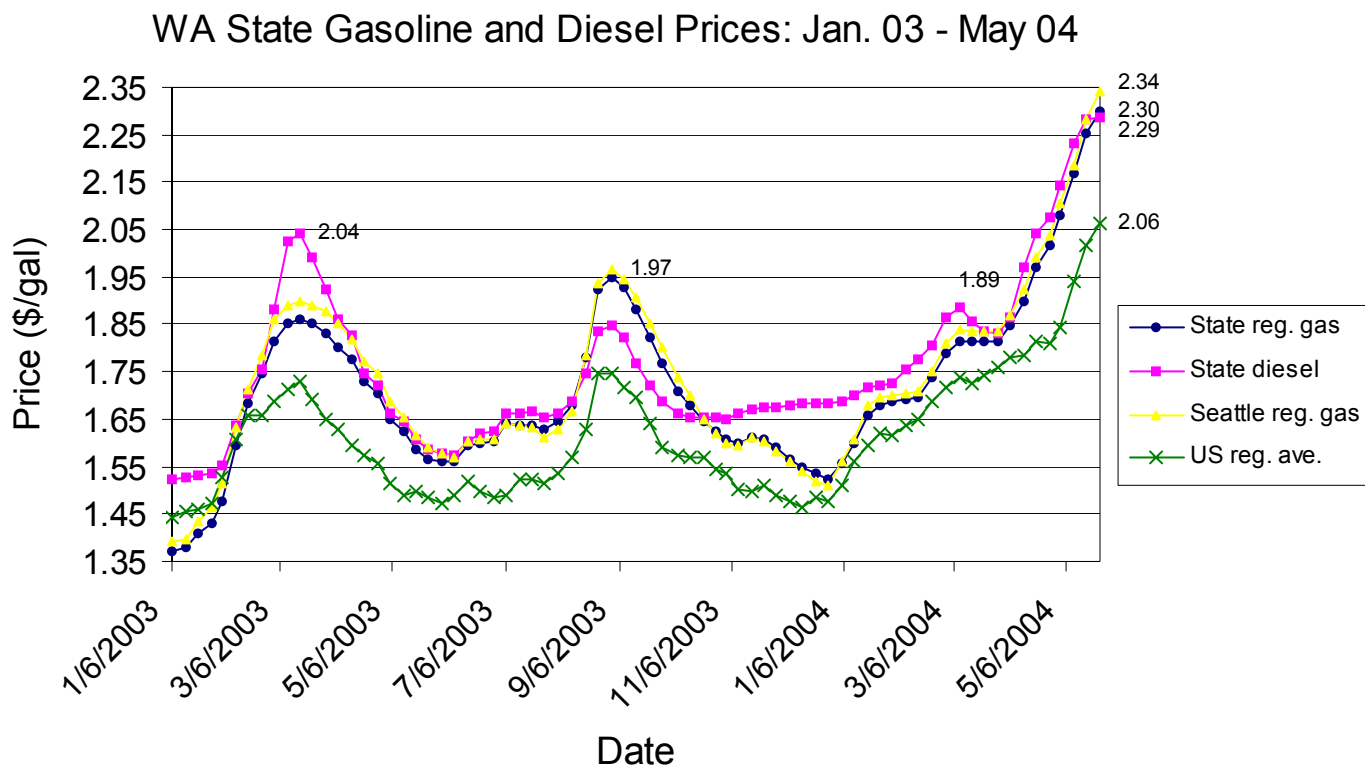
<http://www.cted.wa.gov/DesktopDefault.aspx?TabId=77>

What has happened to gasoline and diesel prices?

Gasoline and diesel prices are not regulated and vary depending on market conditions and their influence on supply and demand fundamentals. After declining to very low levels of less than one dollar per gallon during the winter of 1998-99, gasoline and diesel prices spiked to about 1.68 dollars per gallon on a national basis during June of 2000 – prices were slightly higher on the west coast. This price spike occurred in the early summer when demand for motor vehicle fuel was highest – typically 7 to 9 percent higher than average demand during the winter months. Additional factors that contributed to the price spike were the booming economy, record levels of sports utility vehicles (SUVs) and truck sales, several refinery and pipeline accidents in California and the Midwest, and the Organization of Petroleum Exporting Countries (OPEC) reestablishing limited control over its production quota goals and world crude oil price. Fuel prices declined sharply as the recession began in late 2000.

Prices for gasoline and diesel fuel spiked again in 2003, with the first price spike occurring in March just before the U.S. invasion of Iraq, and the second in late August.

On a national basis gasoline prices averaged 1.75 dollars per gallon for regular unleaded, and were even higher in Washington at 1.86 dollars per gallon for gasoline, and 2.04 dollars per gallon for diesel – both record highs until April of 2004. The first price spike was primarily due to high crude oil prices, caused by the loss of Iraqi oil production and pre-war concerns of more widespread violence and terrorism in the Middle East. Three other factors that also contributed to the price spike were the political unrest in Venezuela and Nigeria, the cold winter on the east coast and a short-term surge in Japanese oil imports for electric power generation; the latter which had a strong impact on diesel fuel prices. The second price spike in August of 2003 was the result of heavy demand that occurred later than normal in the summer, very low crude oil and gasoline inventories from the spring, and several pipeline and refinery accidents. In addition California, which uses a special reformulated blend of gasoline to reduce air pollution, was having difficulty switching to a new formulation that used ethanol as a fuel oxygenate. Figure 1 below shows the average weekly price for regular unleaded gasoline and diesel during 2003 and early 2004. This presents a summary of the information provided by AAA of Washington. Daily fuel price information for the state and for the major cities can be found at the following AAA website.



AAA of Washington, Fuel Price Tracking
<http://www.fuelgaugereport.com/WAavg.asp>

Why have gasoline prices been so volatile lately?

Several factors appear to be driving the recent volatility in the gasoline and diesel markets:

1. High crude oil prices played a major role in two of the recent fuel price spikes. Crude oil prices have been driven by fear of war and more recently terrorism, and by rapidly increasing world crude oil demand, particularly in Asian countries. In addition, two recent announcements by OPEC have increased crude oil prices. First, anticipating excess crude oil supply later in 2004, OPEC announced production quota reductions for its members in order to prevent a radical drop in future oil prices. Second, because world crude oil trading is conducted in U.S. dollars, the weakening U.S. currency has encouraged OPEC to unofficially adjust upward its crude oil price window on which it bases oil production targets.
2. US crude oil demand and imports were at record levels during the summer of 2003 and are expected to exceed these levels during the summer of 2004. Increasing population, more vehicles, and the continuing popularity of less fuel efficient SUVs and trucks are the factors driving growing U.S. demand for petroleum.
3. U.S. refineries are producing near their limit, running at 95% capacity for much of the year, and cannot meet national demand. Consequently, increasing quantities of refined products, such as gasoline and diesel, are being purchased on the spot market and imported into the country: U.S. gasoline imports have risen nearly fourfold, from 3.4 billion gallons in 1983 to 12.9 billion gallons in 2003. With refineries running near capacity during the spring and early summer, the accidental loss of one or two large refineries can cause prices to increase regionally.
4. US inventories of crude oil, gasoline and diesel are currently very low. Recent high crude oil prices have made oil companies and distributors reluctant to make long-term purchases and rebuild inventories. Low crude oil and fuel inventories reduce producers ability to respond to short-term supply upsets, or surges in demand. The link below contains the EIA weekly inventory report.

<http://tonto.eia.doe.gov/oog/info/twip/twip.asp>

How much does crude oil price contribute to gasoline price?

There are four main components to the price of gasoline, with the price of crude oil being the largest contributor:

1. Crude oil cost
2. Federal and state taxes
3. Refinery costs and profit margin
4. Distribution and retail costs, and profit margin

Crude oil cost is the price paid for a barrel of crude oil on the international market divided by 42 gallons in a barrel. This will give the price of crude oil per each gallon of gasoline. This is often the most volatile price of the fuel. Crude oil is traded as a commodity, and as the price goes up, prices for gasoline can change very quickly. When

prices for crude come down, the price for gasoline typically comes down -- but more slowly. This is typical for most commodities.

For every one-dollar increase in the cost of a barrel of crude oil, there is an average increase of about 2.5-cents per gallon of gasoline or diesel. So, a \$10 increase per barrel in crude prices means a 25-cent increase at the pump. A \$15 increase in crude oil means a 37.5-cent a gallon increase in gasoline prices. This additional cost will not go away until several weeks after crude oil prices start to come down.

Taxes for gasoline in Washington are: 18.4 cents/gallon for federal excise taxes, and 28 cents/gallon on average for state and local excise taxes. Local taxes can vary depending on the city and county you live in. Diesel fuel taxes are slightly different than gasoline taxes. About the only fuel price component that doesn't change much over time are taxes.

Refinery margins (the costs and profit charged by the oil companies to wholesalers) must cover all costs associated with production, distribution, and acquisition of gasoline. This includes costs for refining and terminal operation: crude oil processing, oxygenate/ethanol additions, special refining or additions for reformulated fuel, product shipment and storage, oil spill fees, depreciation, brand advertising, purchases of gasoline to cover refinery shortages and profits. Since refineries use some of the energy from a barrel of crude oil to produce the gasoline and diesel end products, higher crude oil costs increase refining costs slightly. Refinery profit margins also tend to go up when fuel prices spike. Recent refinery margins have been double their normal range, signaling higher costs and significantly higher profits per gallon of fuel.

Distribution and retail costs and profit margin (the amount that the dealer or distributor charges for the fuel) includes all costs associated with the distribution and retailing of motor fuel, including but not limited to: franchise fees and/or rents, wages, utilities, supplies, equipment maintenance, environmental fees, licenses, permitting fees, credit card fees, insurance, depreciation, advertising and profit. Dealer/retailer margin normally lags changes in the wholesale price of gasoline.

Also during times of market disturbance - when there are supply shortages or even perceived supply shortages - production (and acquisition) costs will increase beyond normal values because of market fears and speculation. Hoarding and topping off of fuel tanks by consumers can contribute to supply shortages. Prices can escalate very quickly during these situations.

Fig. 2: Component Contribution to Gasoline Cost

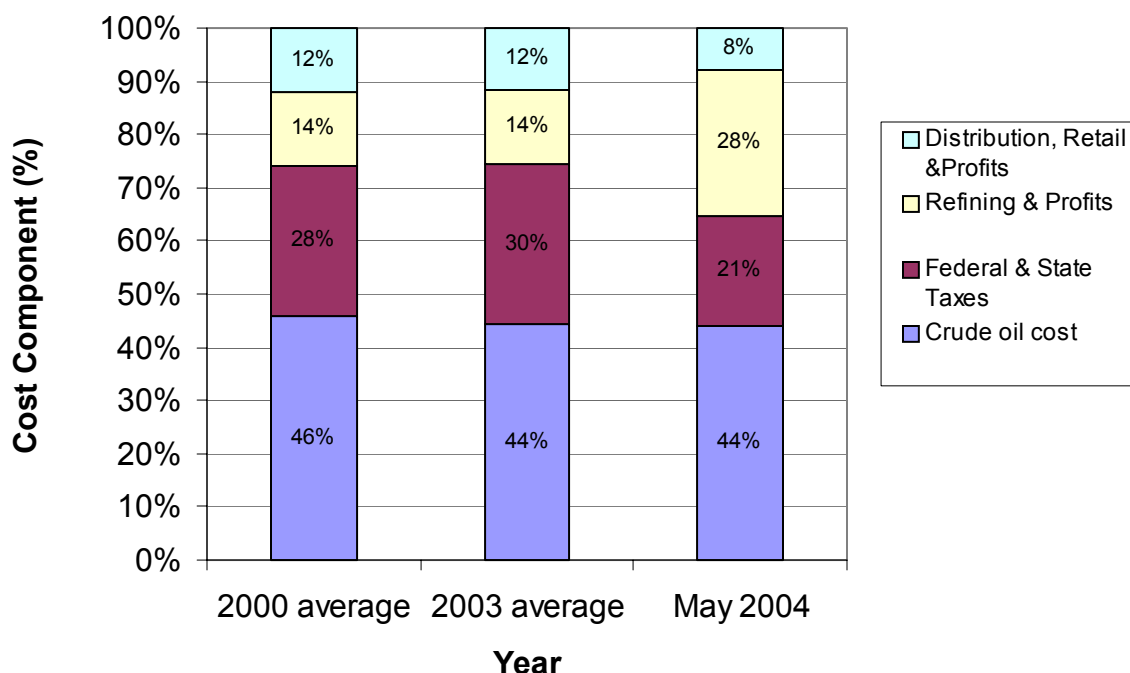


Figure 2 illustrates the retail price share (in percent) of the four components listed above for regular gasoline in Washington State for 2000, 2003 and March of 2004. Refining margins (refining costs and profits) are estimated using current California Energy Commission data.

The cost of crude oil currently comprises about 44 percent of the total cost of a gallon of gasoline. The state tax on gasoline was increased by 5 cents per gallon in 2003: state and federal gasoline taxes made up approximately 30 percent of total cost in 2003, and 21 percent in May of 2004 (same tax amount on a higher overall fuel cost results in a smaller percent share). Most notable is the large increase in refining margins due to high demand and limited extra refining capacity on the west coast.

Aren't oil companies in collusion and setting the price of gasoline?

While rumors and charges of collusion among the oil companies have been raised for decades, the charges have seldom been proven. A notable exception, are the financial settlements reached around 1980 with several oil companies that had violated price and production control regulations during the 1950's through the 1970's. The oil market is now fully deregulated so these kinds of violations could not occur today. In addition, examples of price gouging by local retailers or distributors have been documented in a few states.

The fuel price run-ups in 2000 and 2003 prompted the Federal and some state governments to investigate oil and energy companies for collusion and price fixing. In

general the investigations have been unable to prove the accusations of collusion, and conclude that the price increases are primarily due to supply and demand fundamentals.

Public interest groups frequently point out that substantial fuel price increases at the pump are usually accompanied by even larger increases in refinery profit margins, particularly in states with limited production capacity and wholesale market competition, such as California, and parts of the east coast. Energy companies counter that environmental regulations and public opposition to construction of new refineries (last entirely new refinery was constructed more than 30 years ago) limit their ability to add new refinery capacity. The differing regional blends of gasoline and diesel, developed over the last ten or so years to address various regional environmental problems, also contribute to price volatility in the fuel markets. Special fuel blends make it more difficult for suppliers and refineries to exchange fuel between regions with incompatible formulations.

In Washington State the Attorney General's Office (AGO) maintains a Consumer Protection Division, which responds to complaints about excessive prices, or poor quality for consumer products such as gasoline and diesel. The AGO is monitoring the current fuel price situation in Washington and works with similar offices in California and Oregon. A number of states, including Washington, have initiated various legal challenges to the series of corporate mergers that have occurred in the petroleum industry over the last decade or so. These legal challenges are intended to protect consumers from anti-competitive outcomes from company mergers.

The links below provide information on some of the gasoline price investigations and services of the Washington AGO Consumer Protection Division and others investigate or report on oil, gasoline and diesel prices.

Washington State Attorney General's Office, Consumer Protection Division
<http://www.atg.wa.gov/consumer/gasprices/>

California Energy Commission
http://www.energy.ca.gov/2003_price_spikes/index.html

US Energy Information Administration
http://www.eia.doe.gov/oil_gas/petroleum/info_glance/gasoline.html

What is the Strategic Petroleum Reserve, and why doesn't the Government use it when prices are high?

To plan for future supply disruptions and to establish secure stable supplies, the United States joined with 20 other nations in 1974, following the Arab Oil Embargo, to form the International Energy Agency (IEA). Member nations, including the United States, developed plans to establish strategic reserves for use in any future supply disruptions. The US began filling the Strategic Petroleum Reserves (SPR), a series of above and below ground storage facilities located in several states, in 1977. In early 1991, the SPR experienced an emergency draw down in response to Desert Storm/Desert Shield. The SPR averaged nearly 600 million barrels during 1994 through 1996, giving the nation the

ability to withstand a major loss of imported oil for 60 to 200 days. To further buttress the nation against a loss of oil imports, the Bush Administration began filling the SPR in 2002, with the intent of increasing the reserve volume to 750 million barrels.

Recently, there have been calls to release crude oil from the SPR to moderate the prices of gasoline and diesel fuel. The SPR system was not designed to moderate small supply shortfalls, but rather was meant to carry the nation through an extended and major loss of crude oil imports as would occur with another oil embargo, or a successful terrorist attack against one or more of the large Middle East oil facilities. Current world crude oil supply and demand fundamentals are tight, but do not rise to the threshold originally envisioned for use of the SPR.

What can I do to reduce my gasoline or diesel fuel expenditures?

- **Don't buy more vehicle than you need.** Large, heavy and more powerful vehicles consume significantly more fuel than midsize or compact vehicles. For example a "three quarter-ton" pickup with a larger V-8 gets significantly worse gas mileage, on a percentage basis, than a "half-ton" pickup with a small V-8; a performance V-6 in a midsize car increases fuel consumption relative to the same model with a 4-cylinder engine.
- **If you have multiple vehicles use the most fuel efficient one.**
- **Combine trips if possible.** Not only do you save fuel by combining trips, but a multipurpose trip also results in a warm and efficient engine, which gets better mileage than a cold engine used to make several short independent trips.
- **Shop around for fuel.** Prices can vary by 10 cents per gallon in a relatively small area.
- **Control your acceleration and speed on the highway.** Rapid acceleration reduces your gas mileage - use moderate acceleration to get your car into its top or cruising gear. For every one-mile-per-hour above 60 mph, gas mileage drops by approximately one percent. For less aerodynamic vehicles such as trucks or vans the percentage drop in mileage with increasing speed is even greater.
- **Reduce idling.** Your vehicle is getting zero miles-per-gallon when it idles. Shut your engine off if you won't be moving for 30 seconds or more.
- **Limit air conditioning use.** Your car's air conditioner is driven by the engine and when used heavily can increase fuel consumption by up to 20 percent. Use the flow through ventilation if possible.
- **Keep tires inflated at the recommended pressure.** The US Department of Energy estimates that eliminating every one-pound per square inch of tire under-inflation (relative to manufacturers recommended pressure) in the nation could save four million gallons of gasoline every day.
- **Keep your vehicle properly maintained.** An out-of-tune vehicle uses more fuel and creates more air pollution.
- **Get rid of excess weight.** Carrying excess weight in your vehicle causes the engine to work harder. On average, every 200 pounds of unnecessary weight will reduce fuel economy by up to one-mile-per gallon.

The AAA of Washington and the Alliance to Save Energy provide tips for reducing fuel expenditures at the links below.

http://www.aaawa.com/news_updates/fuel.html

http://www.ase.org/media/newsrel/gas_tips_04_2.htm

The American Council for an Energy Efficient Economy and the US Environmental Protection Agency provide information on new vehicle fuel economy.

<http://www.greencars.com/indexplus.html>

<http://www.fueleconomy.gov/>

This web page was last updated on May 27, 2004 by Greg Nothstein, (360) 956-2098 (gregn@ep.cted.wa.gov). Previous versions of the primer are available.



STATE OF WASHINGTON
DEPARTMENT OF COMMUNITY,
TRADE AND ECONOMIC DEVELOPMENT

Energy Policy Division Briefing Paper
Document Number: 04-03-GN
contact: Greg Nothstein 360.956.2098